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Contract No. DAAH01-92-D-R006
Delivery Order No. 102

**Manufacturing Research of Technologies for Detection,
Discrimination and Classification of Targets in Clutter
(5-34418)**

Final Technical Report for Period
8 April 1996 through 30 September 1996

August 1999

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Prepared for:

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Redstone Arsenal, AL 35898
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PREFACE

This technical report was prepared by the staff of the Research Institute, The University of Alabama in Huntsville. The purpose of this report is to provide documentation of the work performed and results obtained under Delivery Order 102 of MICOM Contract No. DAAH01-92-D-R006. Mr. Gary Maddux was the principal investigator. Mr. Daron Holderfield, Manufacturing Technology Division, Systems Engineering and Production Directorate, Research, Development, and Engineering Center, U.S. Army Missile Command, provided technical coordination. Technical expertise and insights in the detection, discrimination and classification of targets in clutter was provided by Mr. William Pittman, Missile Guidance Directorate, Research, Development, and Engineering Center, U.S. Army Missile Command.

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other official documentation.

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Prepared for: Commander
U.S. Army Missile Command
Redstone Arsenal, AL 35898

I have reviewed this report, dated August 1999 and the report contains no classified information.



Principal Investigator

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1.0 Introduction

The Missile Research, Development, and Engineering Center recently conducted a preliminary investigation of manufacturing technology issues related to Detection, Discrimination and Classification of Targets in Clutter. These new technologies can lead to applications that will significantly improve the performance of missile and other DoD weapon systems.

The Systems Engineering and Production Directorate has the mission and function of evaluating new technologies and determining the impacts of same on the producibility and supportability of MICOM missile systems. SEPD required engineering support in performing assessments on the above technologies. The Systems Management and Production Laboratory at The University of Alabama in Huntsville (UAH) Research Institute (RI) was tasked to provide this engineering support and analytical capability.

2.0 Objective

The purpose of this research task was to review research progress in automatic target recognition, non-cooperative target recognition, and battlefield combat identification, for potential technology insertion in current tactical and strategic weapons as well as for new systems. UAH conducted research to identify and categorize emerging technologies based on the potential for DoD weapons applications and manufacturing technology maturity.

3.0 Statement of Work

The statement of work, as outlined in delivery order 102, was as follows:

UAH shall provide the personnel, resources, expertise and materials required to perform the following efforts:

- 3.1 Conduct preliminary analysis and evaluations of manufacturing processes and technologies related to Detection, Discrimination and Classification of Targets in Clutter. Emphasis shall be placed on identifying activities in the DoD sector related to new manufacturing processes and technologies, new components and subsystems that offer performance increases, and design characteristics compatible with current military hardware and software requirements.
- 3.2 Identify technology alternatives to current technologies of Detection, Discrimination and Classification of Targets in Clutter with analysis of interactions between manufacturing technology processes and trade off considerations.

4.0 Description of Workshop

The work performed on this task led directly to the Workshop on Automatic Target Recognition, which was held at the Sparkman Center Auditorium in 1996. The objective of this workshop was to review the progress of these technologies applicable to DoD weapon systems.

5.0 Conclusion and Recommendations

During the time frame allocated by the delivery order, members of the UAH Applied Research Program, with the cooperation of representatives from MICOM SEPD and Missile Guidance, performed an analysis and evaluation of the detection, discrimination and classification of targets in clutter. Results of these efforts were presented at a locally held workshop. Detailed findings can be found in the proceedings of that workshop, which was compiled by UAH and delivered under separate cover.